Claims

[c1] A method of preparing a multiple chip module (MCM) hat for removal from the MCM, the hat including a base and a piston thermally coupled to a chip and joined to the base by a piston joint, the method comprising the steps of:
applying a force to the piston in a direction away from the chip; and
heating to reflow the piston joint such that the piston retracts from the chip.

[c2] The method of claim 1, further comprising the step of removing the hat from the MCM by applying a shearing force.

[c3] The method of claim 2, wherein the removing step includes removing an epoxy material used to bond the hat to a substrate of the MCM.

[c4] The method of claim 1, wherein the heating step includes maintaining a temperature that will reflow the piston joint, but not a solder bump used to mount the chip.

[c5] The method of claim 4, wherein a difference between a melting point of the piston joint and the solder bump is at least 60Â°C.

[c6] The method of claim 1, wherein the applying force includes applying one of a spring force and a weight force to the piston.

[c7] The method of claim 1, wherein the heating step includes heating the piston joint.

[c8] The method of claim 1, further comprising the step of setting a piston retraction distance.

[c9] An apparatus for preparing a multiple chip module (MCM) for hat removal where the hat includes a piston thermally coupled to a chip, the apparatus comprising:
a heater positioned to reflow a joint between the piston and a base of the hat; and
a retractor for biasing the piston away from the corresponding chip.

[c10] The apparatus of claim 9, wherein the heater includes a heating element of a substantially same shape as the joint.

[c11] The apparatus of claim 9, wherein the heater is coupled to the piston.

[c12] The apparatus of claim 9, wherein the joint includes a solder.

[c13] The apparatus of claim 9, wherein the piston is substantially cylindrical, and the joint includes an annulus about the piston.

[c14] The apparatus of claim 9, wherein the retractor includes one of: a spring biasing device coupled to the piston, and a weight coupled to the piston.

[c15] The apparatus of claim 9, wherein the retractor includes a

piston travel stop to set a retraction distance of the piston.

[c16] The apparatus of claim 9, further comprising a support for the base of the hat.

[c17] The apparatus of claim 9, wherein the hat includes a plurality of pistons, the apparatus further comprising a heater positioned to reflow the joint between each piston and a base of the hat; and a retractor for each piston.

[c18] The apparatus of claim 9, wherein the heating element maintains a temperature that will reflow the joint, but not a solder bump used to mount the chip.

[c19] The apparatus of claim 9, wherein a difference between a melting point of the joint and the solder bump is at least 60Â° C.

[c20] An apparatus for preparing a multiple chip module (MCM) for hat removal, the hat including a base and a piston thermally coupled to a chip and joined to the base by a piston joint, the apparatus comprising:
means for biasing the piston away from the chip; and
means for heating the piston joint to allow the piston to move away from the chip.